ST-D50L

SERVICE MANUAL

AEP Model
UK Model

This Set The Tuner Section
In XO-D50

SPECIFICATIONS

Tuner section

Syslem	MF slereo, FM/AM Superheterodyne tuner

FM tuner section

Tuning range	87.5 to 108 MHz
Antenna terminals	75 ohms unbalanced

MW/LW tuner section

	MW	LW
Tuning range	522 to 1,611 kHz (Italian model) 531 to 1,602 kHz (Other European countries)	144 to 288 kHz (Italian model) 153 to 281 kHz (Other European countries)
Anlenna	AM Loop antenna, External antenna terminal	
Intermediate frequency	450 kHz	

Dimensions	Approx. 355×70×310 mm (Wh/d) (14×2$^{11}/_{16}$×12$^{1}/_{4}$ inches) Iricl. projecting parts and contiols
Weight	Apprtx. 1.9 kg (4 ld 3 oz)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

MICROFILM

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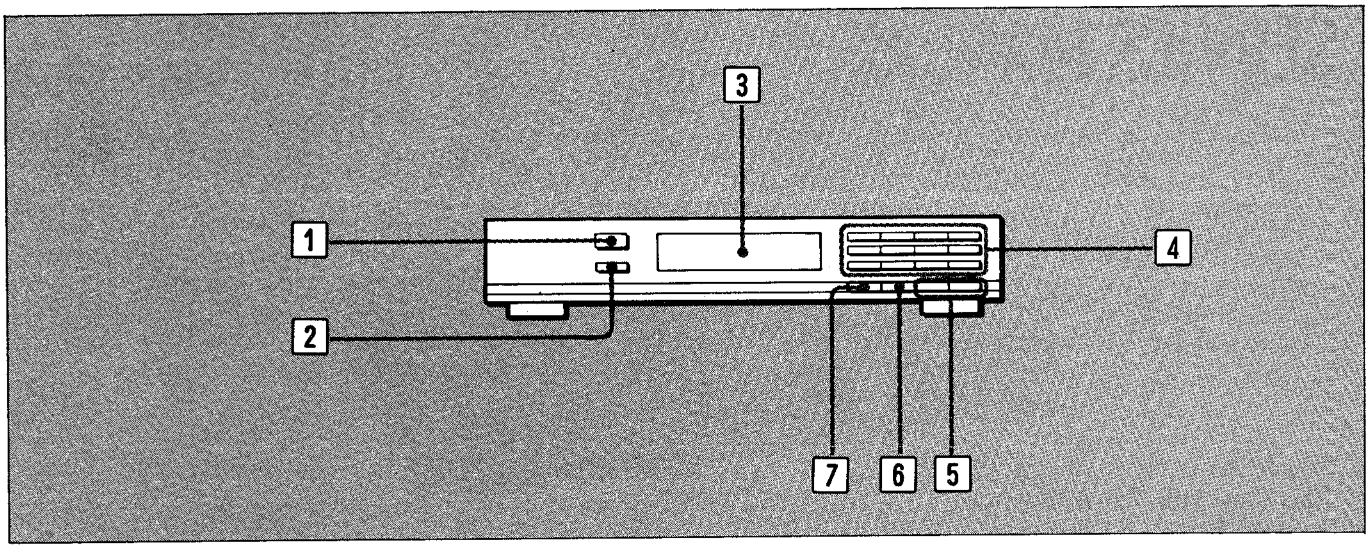
FM STEREO/FM/MW/LW TUNER

SONY®

SECTION 1
GENERAL

1-1. PARTS IDENTIFICATION



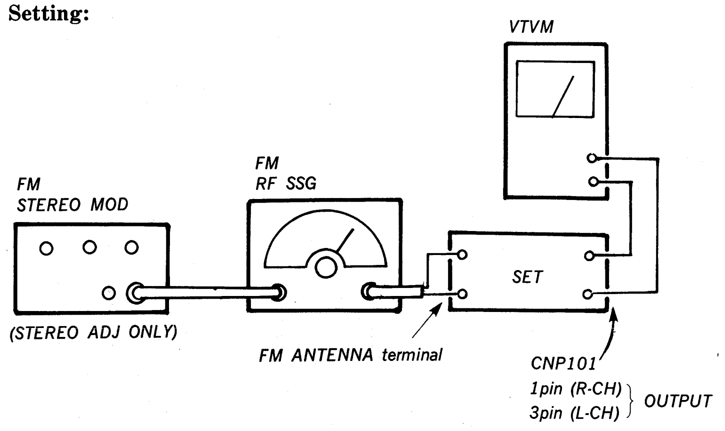
- 1 **BAND selector**
  ST-D50L: FM, MW, LW
  ST-D50S: FM, MW, SW1, SW2
- 2 **AUTO/MANUAL mode selector**
- 3 **Band/frequency display**
- 4 **PRESET buttons**
- 5 **TUNING +/– buttons (station selector)**
- 6 **MEMORY SCAN button**
- 7 **MEMORY button**

SECTION 2
ELECTRICAL ADJUSTMENTS

- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.

2-1. FM SECTION ADJUSTMENT

Setting:


VTVM
FM RF SSG
FM STEREO MOD
SET
(STEREO ADJ ONLY)
FM ANTENNA terminal
CNP101
1pin (R-CH)
3pin (L-CH)
OUTPUT

Carrier frequency : 98MHz
Modulation : 1kHz
Deviation : 40kHz (MONO only)
Output level : 66dBμ (at NULL/STEREO Adjustment)
: 25dBμ (at TUNED Adjustment)

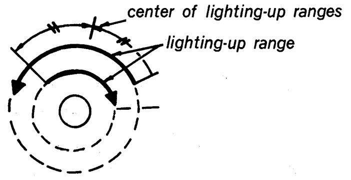
Stereo MOD setting
Sub channel : 38kHz
Deviation : 16.25kHz
Pilot signal : 19kHz
Deviation : 7.5kHz
Modulation : 1kHz—16.25kHz deviation

1. Discriminator Alignment (NULL check)

1. Push the TUNING (+, −) button for 98MHz.
2. Adjust T251 for 0V reading on the VTVM.
   test point ≒ TP101

2. Tuned Lighting-on Adjustment

1. Puch the TUNING (+, −) button for 98MHz.
2. Tune RV103 clockwise or counterclockwise and memorize the lighting-up range of tuned indicator.
3. Adjust RV103 at the center of the lighting-up range of both turns as shown below.


center of lighting-up ranges
lighting-up range

3. Stereo Separation Adjustment

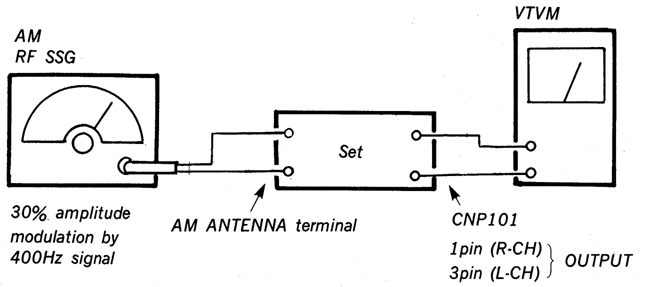
FM stereo signal generator output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ Adjust RV101 for minimum reading.
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ Adjust RV101 for minimum reading.

L-CH Stereo separation : Ⓐ—Ⓑ
R-CH Stereo separation : Ⓒ—Ⓓ

The separation of both channels should be equal.
Specification : 35dB

2-2. AM SECTION ADJUSTMENTS

Setting:


VTVM
AM RF SSG
Set
30% amplitude modulation by 400Hz signal
AM ANTENNA terminal
CNP101
1pin (R-CH)
3pin (L-CH)
OUTPUT

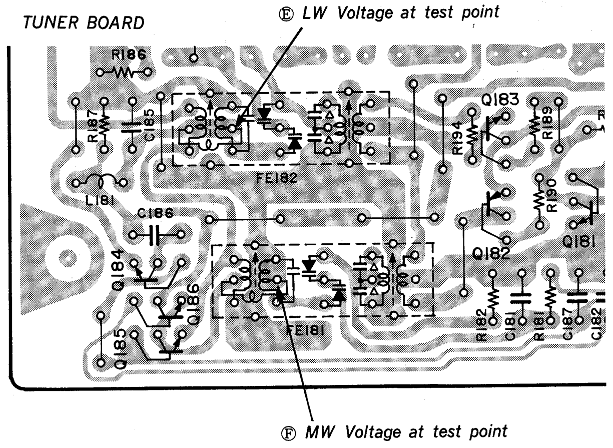
1. LW Frequency Coverage Adjustment

Frequency display in set	AEP, UK, WG model	153kHz	281kHz
	IT model	144kHz	288kHz
Adjustment part		FE182(OSC)	
Voltage at test point		VT Ⓔ 1V±0.2V	

2. MW Frequency Coverage Adjustment

Frequency display in set	AEP, UK, WG model	531kHz	1602kHz
	IT model	522kHz	1611kHz
Adjustment part		FE181(OSC)	
Voltage test point		VT Ⓕ ①V±0.2V	

Adjustment Location:


TUNER BOARD
Ⓔ LW Voltage at test point
Ⓕ MW Voltage at test point
R186
R187
C185
FE182
L181
C186
Q184
Q186
Q185
FE181
Q183
R194
R189
R190
Q182
Q181
R182
C181
R181
C187
C182

3. LW Tracking Adjustment

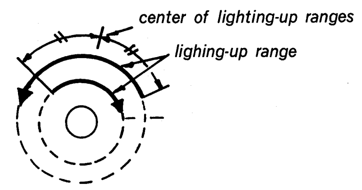
Frequency display in set	AEP, UK, WG model	153kHz
	IT model	144kHz
Adjustment part	FE182 (ANT)	
Adjustment for a maximum reading on VTVM.		

4. MW Tracking Adjustment

Frequency display in set	AEP, UK, WG model	531kHz
	IT model	522kHz
Adjustment part	FE181 (ANT)	
Adjust for a maximum reading on VTVM.		

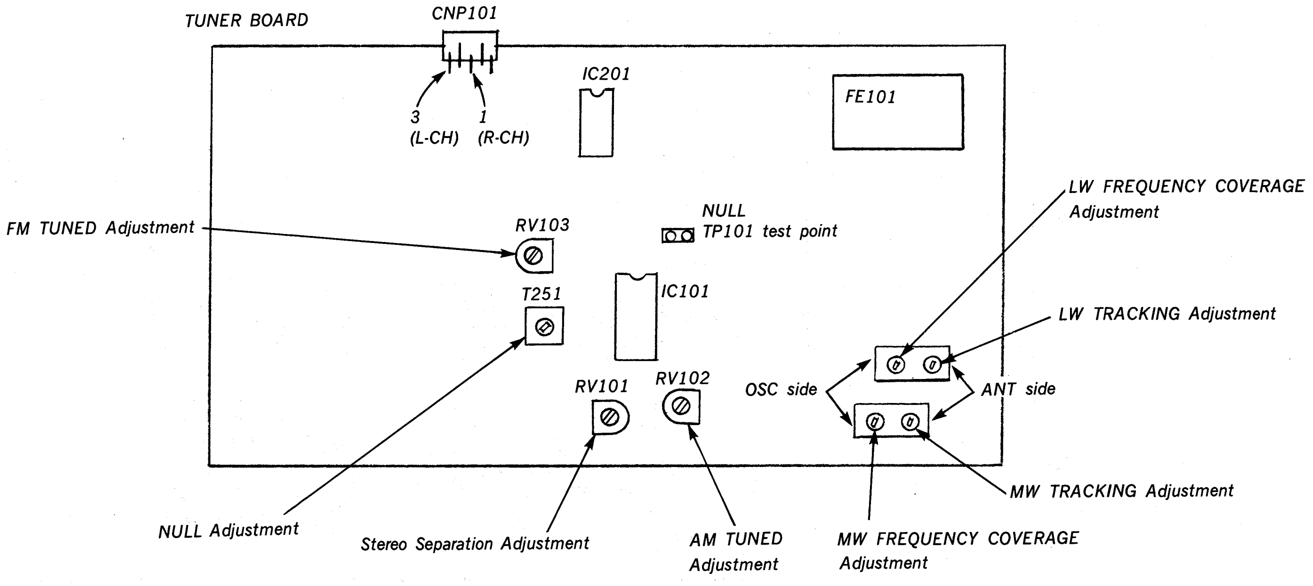
5. Tuned Lighting-on Adjustment

1. Push the TUNING (+, −) button for LW: 281kHz (AEP/UK, WG model) or 288kHz (IT model).
2. Turn RV102 clockwise or counter clockwise and memorize the lighting-up range of tuned indicator.
3. Adjust RV102 at the center of the lighting-up range of both turns as shown below.


center of lighting-up ranges
lighing-up range

At SSG OUTPUT 68dBμ

Adjustment Location:

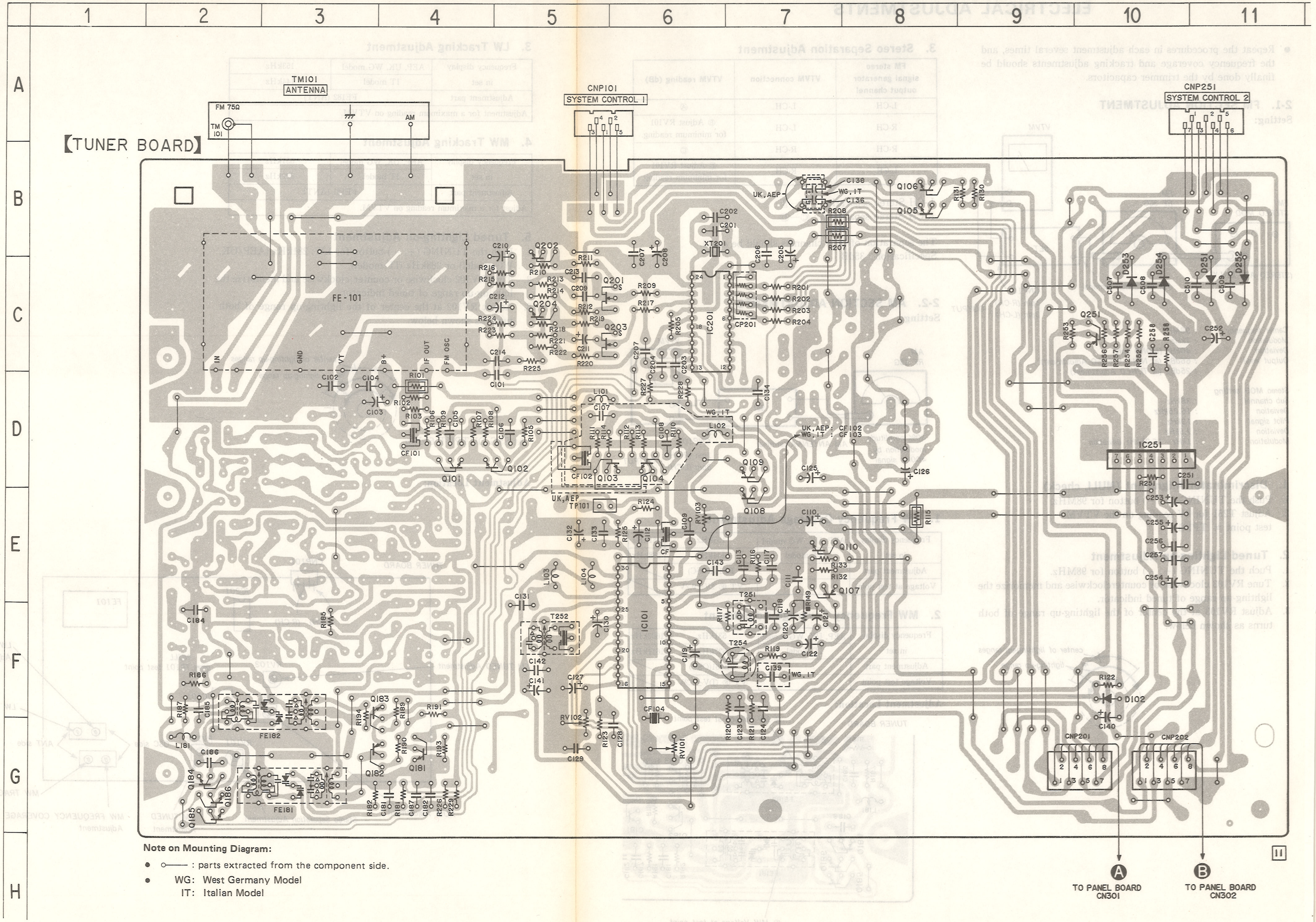

TUNER BOARD
CNP101
3 (L-CH)
1 (R-CH)
IC201
FE101
FM TUNED Adjustment
RV103
NULL
TP101 test point
T251
IC101
RV101
RV102
OSC side
ANT side
LW FREQUENCY COVERAGE Adjustment
LW TRACKING Adjustment
MW TRACKING Adjustment
NULL Adjustment
Stereo Separation Adjustment
AM TUNED Adjustment
MW FREQUENCY COVERAGE Adjustment

SECTION 3 DIAGRAMS

- **Semiconductor Location**

Ref. No.	Location
D102	F-10
D251	C-11
D252	C-11
D253	C-10
D254	C-10
IC101	F-6
IC201	C-6
IC251	C-10
Q101	D-4
Q102	D-5
Q103	D-5
Q104	D-6
Q105	B-8
Q106	B-8
Q107	E-7
Q108	E-7
Q109	D-7
Q110	E-7
Q181	G-4
Q182	G-3
Q183	F-3
Q184	G-2
Q185	G-2
Q186	G-2
Q201	C-5
Q202	B-5
Q203	C-5
Q204	C-5
Q251	C-10

3-1. PRINTED WIRING BOARD—TUNER SECTION— • Refer to page 10 for Semiconductor Lead Layouts.

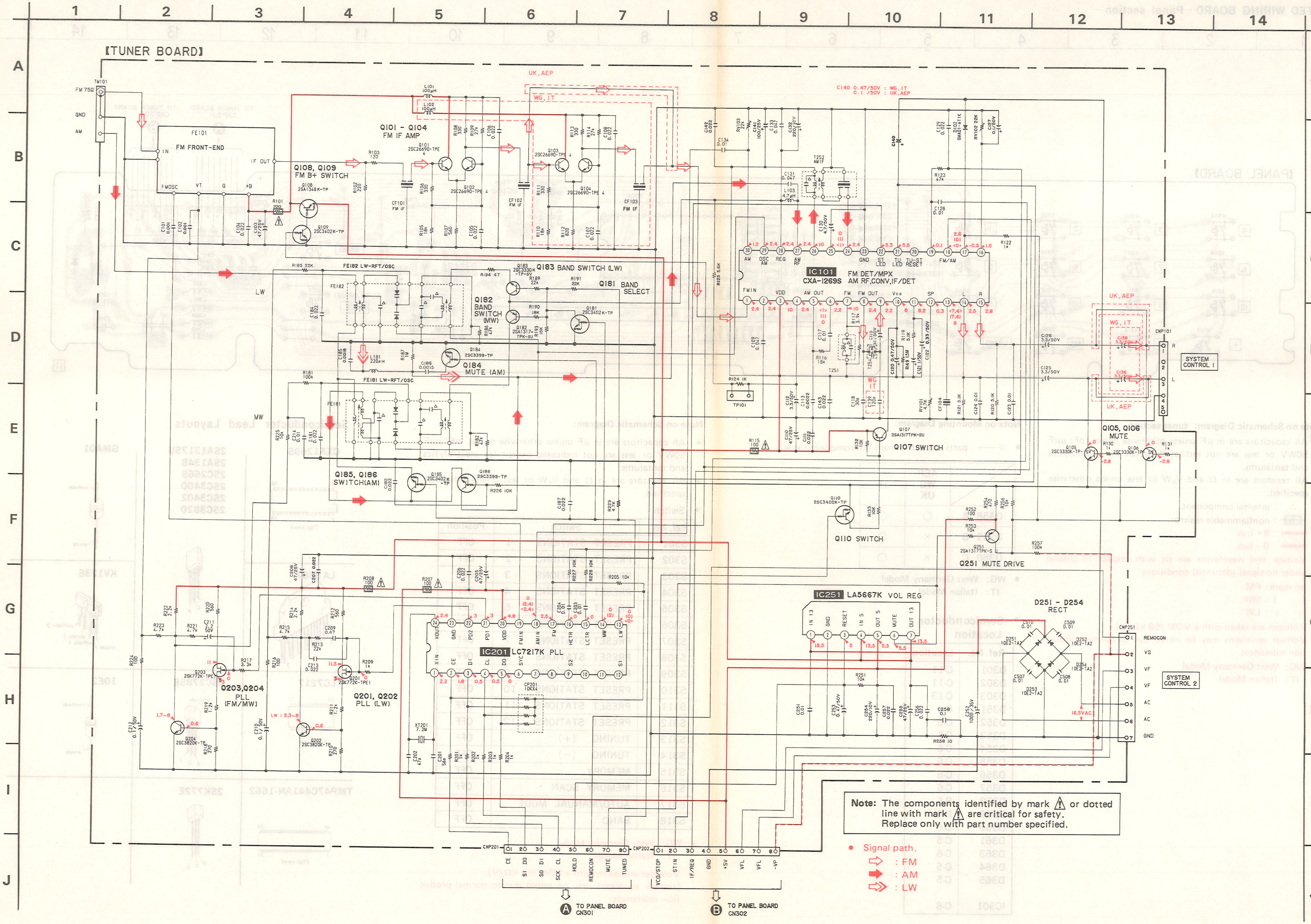

1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
【TUNER BOARD】
TM101 ANTENNA
FM 75Ω
AM
CNP101 SYSTEM CONTROL 1
CNP251 SYSTEM CONTROL 2
FE-101
IN
GND
VT
B+
IF OUT
FM OSC
IC101
IC201
IC251
CP201
XT201
T251
T252
T254
CF101
CF102
CF104
L101
L102
L103
L104
L181
FE181
FE182
RV101
RV102
RV103
TP101
UK, AEP
WG, IT
UK, AEP : CF102
WG, IT : CF103
CNP201
CNP202
D102
D251
D252
D253
D254
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q108
Q109
Q110
Q181
Q182
Q183
Q184
Q185
Q186
Q201
Q202
Q203
Q204
Q251
Ⓐ TO PANEL BOARD CN301
Ⓑ TO PANEL BOARD CN302
11

Note on Mounting Diagram:

- ○—— : parts extracted from the component side.
- WG: West Germany Model
  IT: Italian Model

3-2. SCHEMFITIC DIAGRAM—TUNER SECTION—

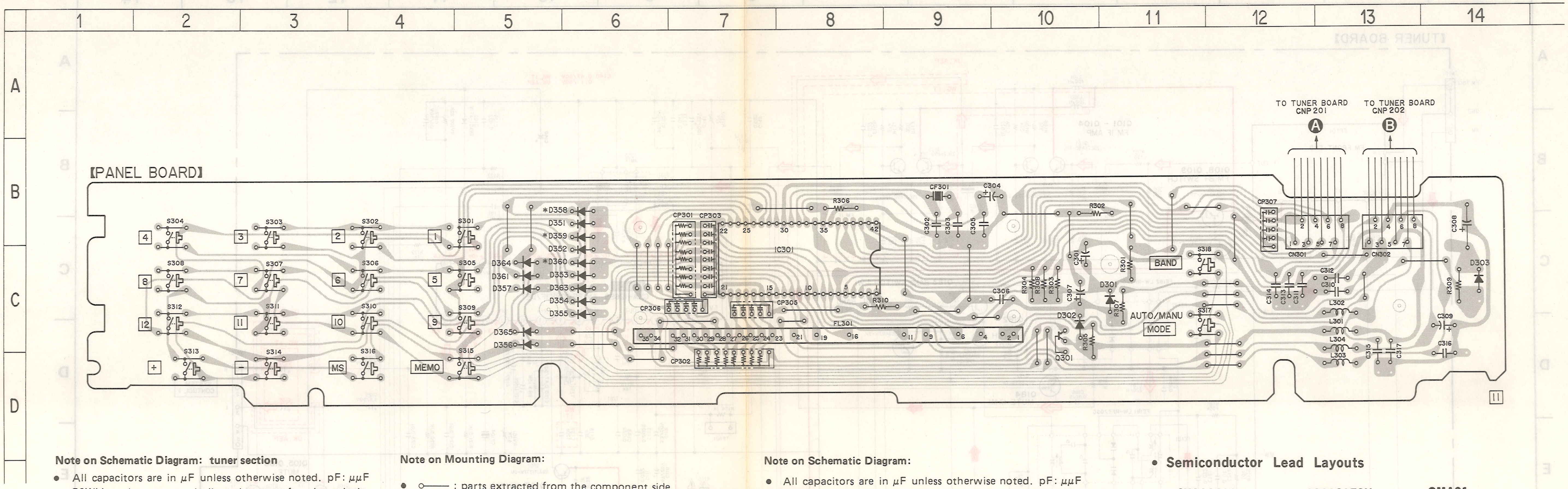
- Refer to page 9 for notes.


【TUNER BOARD】
FM 75Ω
GND
AM
TM101
FE101
FM FRONT-END
IN
IF OUT
FMOSC
VT
G
+B
UK,AEP
WG,IT
Q101 - Q104
FM IF AMP
Q108, Q109
FM B+ SWITCH
CF101 FM IF
CF102 FM IF
CF103 FM IF
L101 100μH
L102 100μH
C140 0.47/50V : WG,IT
0.1 /50V : UK,AEP
T252 AM IF
FE182 LW-RFT/OSC
FE181 LW-RFT/OSC
LW
MW
Q183 BAND SWITCH (LW)
Q181 BAND SELECT
Q182 BAND SWITCH (MW)
Q184 MUTE (AM)
Q185, Q186 SWITCH(AM)
IC101 CXA-1269S FM DET/MPX AM RF,CONV,IF/DET
AM OSC
REG
AM RF
GND
ST LED
TU LED
TU-ST RESET
FM/AM
FMIN
VDD
AM OUT
FM
FM OUT
Vco
SP
L
R
TP101
Q107 SWITCH
Q110 SWITCH
Q105, Q106 MUTE
CNP101
SYSTEM CONTROL 1
Q251 MUTE DRIVE
IC251 LA5667K VOL REG
IN 13
GND
RESET
IN 5
OUT 5
MUTE
OUT 13
D251 - D254 RECT
CNP251
REMOCON
VG
VF
VF
AC
AC
GND
SYSTEM CONTROL 2
16.5VAC
IC201 LC7217K PLL
XIN
CE
DI
CL
DO
SYC
FMIN
AMIN
FM
HCTR
LCTR
MW
LW
S1
S2
XOUT
GND
PD2
PD1
VDD
XT201 7.2M
CP201 10KX4
Q203,Q204 PLL (FM/MW)
Q201, Q202 PLL (LW)
CNP201
CE
SI DO
SO DI
SCK CL
HOLD
REMOCON
MUTE
TUNED
CNP202
VCO/STOP
ST IN
IF/REQ
GND
+5V
VFL
VFL
-VP
A TO PANEL BOARD CN301
B TO PANEL BOARD CN302

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Signal path.
  - ⇨ : FM
  - ➡ : AM
  - ⇨» : LW

3-3. PRINTED WIRING BOARD—Panel section—


1
2
3
4
5
6
7
8
9
10
11
12
13
14
A
B
C
D
【PANEL BOARD】
TO TUNER BOARD CNP201
TO TUNER BOARD CNP202
A
B
4 S304
3 S303
2 S302
1 S301
8 S308
7 S307
6 S306
5 S305
12 S312
11 S311
10 S310
9 S309
+ S313
− S314
MS S316
MEMO S315
*D358
D351
*D359
D352
*D360
D353
D363
D354
D355
D364
D361
D357
D365
D356
CP301
CP303
CP305
CP306
CP302
CP307
IC301
FL301
R306
R310
R302
R301
R304
R303
R305
R307
R309
C302
C303
C305
C304
C306
C301
C307
C308
C309
C310
C311
C312
C313
C314
C315
C316
C317
D301
D302
D303
Q301
BAND
S318
AUTO/MANU MODE
S317
CN301
CN302
L301
L302
L303
L304
II

Note on Schematic Diagram: tuner section

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $^1/_4$W or less unless otherwise specified.
- △ : internal component.
- ⊣▭⊢ : nonflammable resistor.
- ▬▬ : B+ bus.
- ▬ ▬ ▬ : B− bus.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
  (　　) : MW
  〈　　〉 : LW
- Voltages are taken with a VOM (50 kΩ/V).
  Voltage variations may be noted due to normal production tolerances.
- WG: West Germany Model
  IT: Italian Model

Note on Mounting Diagram:

- ○—— : parts extracted from the component side.

	AEP WG UK	IT
D358 A	○	○
D359 B	×	○
D360 C	×	○

- WG: West Germany Model
  IT: Italian Model

- **Semiconductor Location**

Ref. No.	Location
D301	C-11
D302	C-11
D303	C-13
D351	B-6
D352	C-6
D353	C-6
D354	C-6
D355	C-6
D356	C-6
D357	C-6
D358	B-6
D359	B-6
D360	C-6
D361	C-5
D363	C-6
D364	C-5
D365	C-5
IC301	C-8

Note on Schematic Diagram:

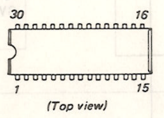
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $^1/_4$W or less unless otherwise specified.
- Switch

Ref. No.	Switch	Position
S301	PRESET STATIONS 1	OFF
S302	PRESET STATIONS 2	OFF
S303	PRESET STATIONS 3	OFF
S304	PRESET STATIONS 4	OFF
S305	PRESET STATIONS 5	OFF
S306	PRESET STATIONS 6	OFF
S307	PRESET STATIONS 7	OFF
S308	PRESET STATIONS 9	OFF
S309	PRESET STATIONS 9	OFF
S310	PRESET STATIONS 10	OFF
S311	PRESET STATIONS 11	OFF
S312	PRESET STATIONS 12	OFF
S313	TUNING (+)	OFF
S314	TUNING (−)	OFF
S315	MEMORY	OFF
S316	MEMORY SCAN	OFF
S317	AUTO/MANUAL MODE	OFF
S318	BAND	OFF

- WG: West Germany Model
  IT: Italian Model
- Voltages are taken with a VOM (50 kΩ/V).
  Voltage variations may be noted due to normal production tolerances.

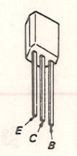
- **Semiconductor Lead Layouts**

CXA1269S

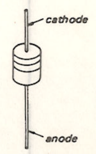


(Top view)

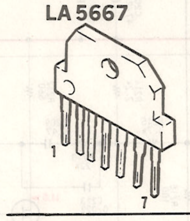
2SA1317SU
2SA1348
2SC2669
2SC3400
2SC3402
2SC3820



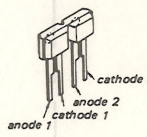
GMA01


cathode
anode

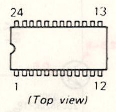
LA5667



KV1236

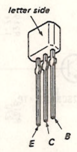

cathode 2
anode 2
cathode 1
anode 1

LC7217

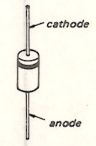


(Top view)

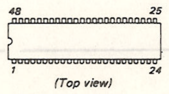
2SC2785E


letter side
E
C
B

10E2

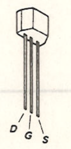

cathode
anode

TMP47C441AN-1662

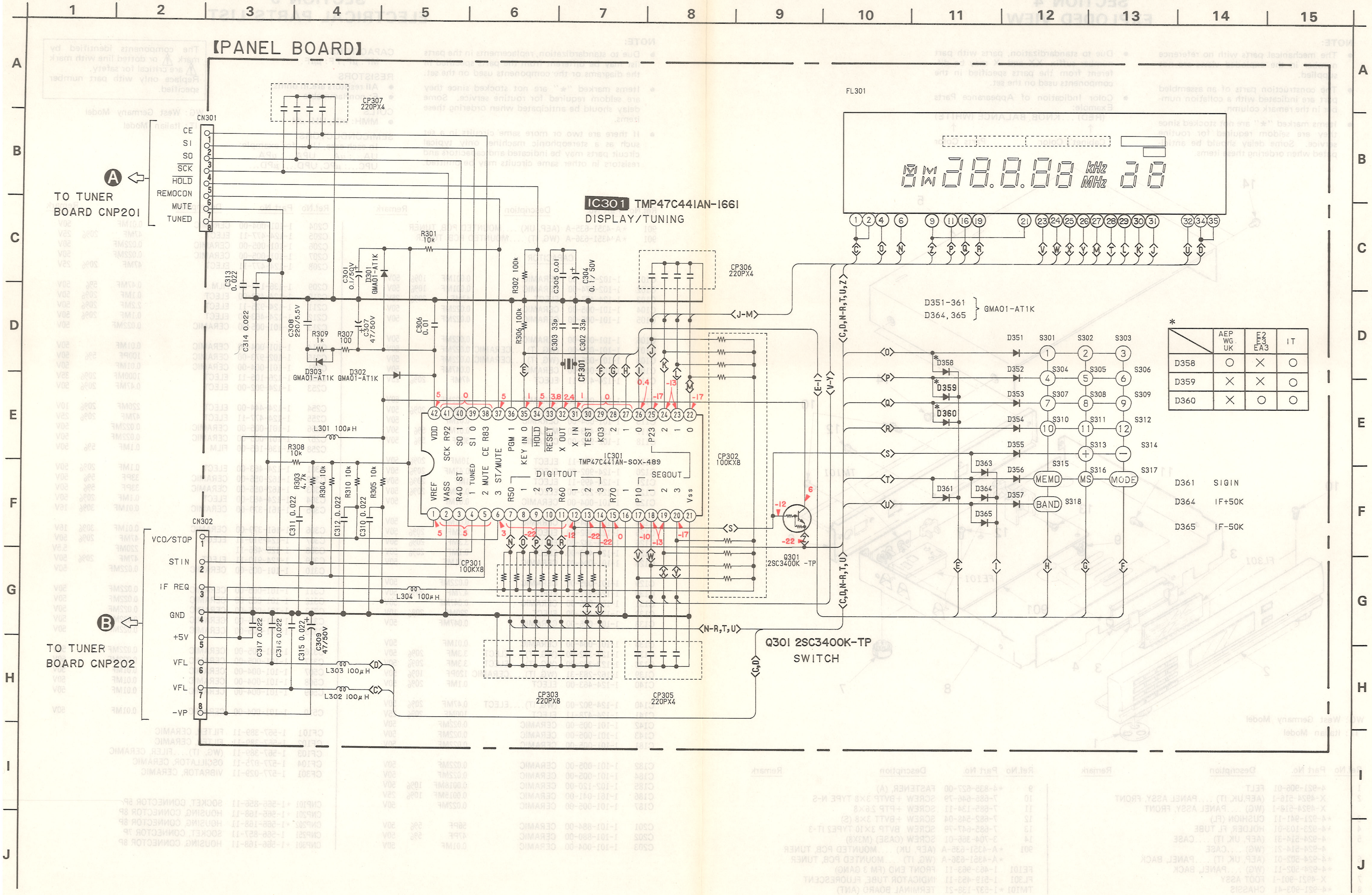


(Top view)

2SK772E



3-4. SCHEMATIC DIAGRAM—Panel section—


[PANEL BOARD]
A
TO TUNER BOARD CNP201
CN301
CE
SI
SO
SCK
HOLD
REMOCON
MUTE
TUNED
B
TO TUNER BOARD CNP202
CN302
VCO/STOP
ST IN
IF REQ
GND
+5V
VFL
VFL
-VP
IC301 TMP47C441AN-1661
DISPLAY/TUNING
IC301
TMP47C441AN-SOX-489
DIGITOUT
SEGOUT
VDD
VREF
VASS
SCK R92
SO 1
SI 0
CE R83
PGM 1
KEY IN 0
HOLD
RESET
X OUT
X IN
TEST
K03
P23
P10
R40 ST
R50
R60
R70
Vss
1 TUNED
2 MUTE
3 ST/MUTE
FL301
CP301 100KX8
CP302 100KX8
CP303 220PX8
CP305 220PX4
CP306 220PX4
CP307 220PX4
CF301
R301 10k
R302 100k
R303 4.7k
R304 10k
R305 10k
R306 100k
R307 100
R308 10k
R309 1k
R310 10k
C301 0.1/50V
C302 33p
C303 33p
C304 0.1/50V
C305 0.01
C306 0.01
C307 47/50V
C308 220/5.5V
C309 47/50V
C310 0.022
C311 0.022
C312 0.022
C313 0.022
C314 0.022
C315 0.022
C316 0.022
C317 0.022
L301 100μH
L302 100μH
L303 100μH
L304 100μH
D301 GMA01-AT1K
D302 GMA01-AT1K
D303 GMA01-AT1K
D351-361
D364, 365
GMA01-AT1K
Q301 2SC3400K-TP
Q301 2SC3400K-TP SWITCH
S301
S302
S303
S304
S305
S306
S307
S308
S309
S310
S311
S312
S313
S314
S315
S316
S317
S318
MEMO
MS
MODE
BAND
D361 SIGIN
D364 IF+50K
D365 IF-50K
kHz
MHz
C,D,N-R,T,U,Z
C,D,N-R,T,U
N-R,T,U
C,D
J-M
E-I
V-Y
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J

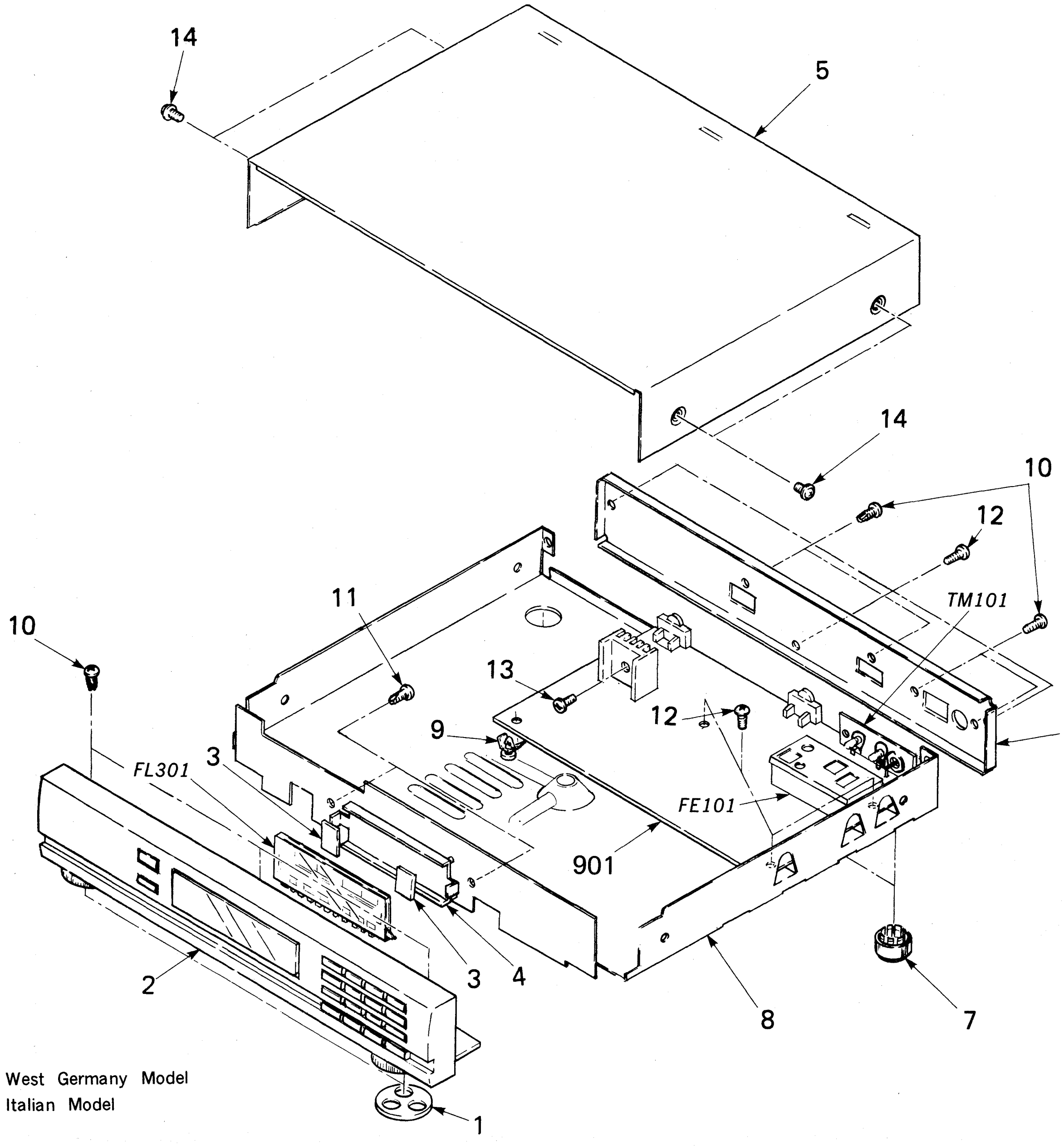
*

	AEP WG UK	E2 E3 EA3	IT
D358	○	×	○
D359	×	×	○
D360	×	○	○

SECTION 4
EXPLODED VIEW

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts Example:
  (RED) ... KNOB, BALANCE (WHITE)
  ↑ ↑
  Cabinet's Color Parts Color



WG: West Germany Model
IT: Italian Model

Ref.No	Part No.	Description	Remark
1	4-921-906-01	FELT	
2	X-4924-516-1	(AEP,UK, IT) ....PANEL ASSY, FRONT	
	X-4924-518-1	(WG) ....PANEL ASSY, FRONT	
3	★4-921-941-11	CUSHION (FL)	
4	★4-923-103-01	HOLDER, FL TUBE	
5	4-924-514-31	(AEP, UK, IT) ....CASE	
	4-924-514-21	(WG) ....CASE	
6	★4-924-502-01	(AEP, UK, IT) ....PANEL, BACK	
	★4-924-502-11	(WG) ....PANEL, BACK	
7	X-4921-901-1	FOOT ASSY	
8	★4-921-903-41	CHASSIS	
9	★4-835-627-00	FASTENER, (A)	
10	7-685-646-79	SCREW +BVTP 3×8 TYPE N-S	
11	7-685-134-11	SCREW +PTP 2.6×8	
12	7-682-548-04	SCREW +BVTT 3×8 (S)	
13	7-685-647-79	SCREW BVTP 3×10 TYPE2 IT-3	
14	3-704-366-01	SCREW (CASE) (M3X8)	
901	★A-4351-635-A	(AEP, UK) ....MOUNTED PCB, TUNER	
	★A-4351-636-A	(WG, IT) ....MOUNTED PCB, TUNER	
FE101	1-463-963-11	FRONT END (FM 3 GANG)	
FL301	1-519-453-11	INDICATOR TUBE, FLUORESCENT	
TM101	★1-537-138-21	TERMINAL BOARD (ANT)	

SECTION 5
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

WG: West Germany Model
IT: Italian Model

Ref.No	Part No.	Description			Remark
901	★A-4351-635-A	(AEP, UK) ....MOUNTED PCB, TUNER			
901	★A-4351-636-A	(WG, IT) ....MOUNTED PCB, TUNER			
		CAPACITOR			
C101	1-102-074-00	CERAMIC	0.001MF	10%	50V
C102	1-102-074-00	CERAMIC	0.001MF	10%	50V
C103	1-124-477-11	ELECT	47MF	20%	25V
C104	1-101-005-00	CERAMIC	0.022MF		50V
C105	1-101-005-00	CERAMIC	0.022MF		50V
C106	1-101-005-00	CERAMIC	0.022MF		50V
C107	1-101-005-00	(WG, IT)....CERAMIC	0.022MF		50V
C108	1-101-005-00	(WG, IT)....CERAMIC	0.022MF		50V
C109	1-101-006-00	CERAMIC	0.047MF		50V
C110	1-124-477-11	ELECT	47MF	20%	25V
C111	1-101-005-00	CERAMIC	0.022MF		50V
C112	1-123-382-00	ELECT	3.3MF	20%	50V
C113	1-101-004-00	CERAMIC	0.01MF		50V
C117	1-130-483-00	MYLAR	0.01MF	5%	50V
C118	1-102-962-00	CERAMIC	30PF	5%	50V
C119	1-123-875-11	ELECT	10MF	20%	50V
C120	1-124-902-00	ELECT	0.47MF	20%	50V
C121	1-124-499-11	ELECT	1MF	20%	50V
C122	1-124-252-00	ELECT	0.33MF	20%	50V
C123	1-101-004-00	CERAMIC	0.01MF		50V
C124	1-101-004-00	CERAMIC	0.01MF		50V
C125	1-123-382-00	ELECT	3.3MF	20%	50V
C126	1-123-382-00	ELECT	3.3MF	20%	50V
C127	1-124-463-00	ELECT	0.1MF	20%	50V
C128	1-101-004-00	CERAMIC	0.01MF		50V
C129	1-101-005-00	CERAMIC	0.022MF		50V
C130	1-124-927-11	ELECT	4.7MF	20%	50V
C131	1-101-006-00	CERAMIC	0.047MF		50V
C132	1-124-444-00	ELECT	220MF	20%	10V
C133	1-101-006-00	CERAMIC	0.047MF		50V
C134	1-101-004-00	CERAMIC	0.01MF		50V
C136	1-123-382-00	(WG, IT)....ELECT	3.3MF	20%	50V
C138	1-123-382-00	(WG, IT)....ELECT	3.3MF	20%	50V
C139	1-162-283-31	(WG, IT)....CERAMIC	120PF	10%	50V
C140	1-124-463-00	ELECT	0.1MF	20%	50V
C140	1-124-902-00	(WG, IT)....ELECT	0.47MF	20%	50V
C141	1-124-478-11	ELECT	100MF	20%	25V
C142	1-101-005-00	CERAMIC	0.022MF		50V
C143	1-101-005-00	CERAMIC	0.022MF		50V
C181	1-101-005-00	CERAMIC	0.022MF		50V
C182	1-101-005-00	CERAMIC	0.022MF		50V
C184	1-101-005-00	CERAMIC	0.022MF		50V
C185	1-102-120-00	CERAMIC	0.0018MF	10%	50V
C186	1-161-041-00	CERAMIC	0.0015MF	10%	25V
C187	1-101-005-00	CERAMIC	0.022MF		50V
C201	1-101-884-00	CERAMIC	56PF	5%	50V
C202	1-101-880-00	CERAMIC	47PF	5%	50V
C203	1-101-004-00	CERAMIC	0.01MF		50V
C204	1-101-004-00	CERAMIC	0.01MF		50V
C205	1-124-477-11	ELECT	47MF	20%	25V
C206	1-101-005-00	CERAMIC	0.022MF		50V
C207	1-101-005-00	CERAMIC	0.022MF		50V
C208	1-124-477-11	ELECT	47MF	20%	25V
C209	1-136-173-00	FILM	0.47MF	5%	50V
C210	1-124-463-00	ELECT	0.1MF	20%	50V
C211	1-124-925-11	ELECT	2.2MF	20%	50V
C212	1-124-463-00	ELECT	0.1MF	20%	50V
C213	1-101-005-00	CERAMIC	0.022MF		50V
C214	1-101-004-00	CERAMIC	0.01MF		50V
C215	1-102-973-00	CERAMIC	100PF	5%	50V
C251	1-101-004-00	CERAMIC	0.01MF		50V
C252	1-126-105-11	ELECT	1000MF	20%	35V
C253	1-124-902-00	ELECT	0.47MF	20%	50V
C254	1-124-444-00	ELECT	220MF	20%	10V
C255	1-124-477-11	ELECT	47MF	20%	25V
C256	1-101-005-00	CERAMIC	0.022MF		50V
C257	1-101-005-00	CERAMIC	0.022MF		50V
C258	1-136-165-00	FILM	0.1MF	5%	50V
C301	1-124-463-00	ELECT	0.1MF	20%	50V
C302	1-162-056-00	CERAMIC	33PF	5%	50V
C303	1-162-056-00	CERAMIC	33PF	5%	50V
C304	1-124-463-00	ELECT	0.1MF	20%	50V
C305	1-161-379-00	CERAMIC	0.01MF	30%	16V
C306	1-161-379-00	CERAMIC	0.01MF	30%	16V
C307	1-124-910-11	ELECT	47MF	20%	50V
C308	1-125-486-11		220MF		5.5V
C309	1-124-910-11	ELECT	47MF	20%	50V
C310	1-101-005-00	CERAMIC	0.022MF		50V
C311	1-101-005-00	CERAMIC	0.022MF		50V
C312	1-101-005-00	CERAMIC	0.022MF		50V
C313	1-101-005-00	CERAMIC	0.022MF		50V
C314	1-101-005-00	CERAMIC	0.022MF		50V
C315	1-101-005-00	CERAMIC	0.022MF		50V
C316	1-101-005-00	CERAMIC	0.022MF		50V
C317	1-101-005-00	CERAMIC	0.022MF		50V
C507	1-101-004-00	CERAMIC	0.01MF		50V
C508	1-101-004-00	CERAMIC	0.01MF		50V
C509	1-101-004-00	CERAMIC	0.01MF		50V
C510	1-101-004-00	CERAMIC	0.01MF		50V
CF101	1-567-389-11	FILTER, CERAMIC			
CF102	1-567-389-11	FILTER, CERAMIC			
CF103	1-567-389-11	(WG, IT)....FILER, CERAMIC			
CF104	1-577-075-11	OSCILLATOR, CERAMIC			
CF301	1-577-029-11	VIBRATOR, CERAMIC			
CNP101	★1-566-856-11	SOCKET, CONNECTOR 5P			
CNP201	★1-566-168-11	HOUSING, CONNECTOR 8P			
CNP202	★1-566-168-11	HOUSING, CONNECTOR 8P			
CNP251	1-566-857-11	SOCKET, CONNECTOR 7P			
CNP301	★1-566-168-11	HOUSING, CONNECTOR 8P			

Ref.No	Part No.	Description	Remark
CNP302	*1-566-168-11	HOUSING, CONNECTOR 8P	
CP201	1-233-125-11	COMPOSITION CIRCUIT BLOCK	
CP301	1-233-140-11	COMPOSITION CIRCUIT BLOCK	
CP302	1-233-140-11	COMPOSITION CIRCUIT BLOCK	
CP303	1-233-151-	COMPOSITION CIRCUIT BLOCK	
CP305	1-233-150-	COMPOSITION CIRCUIT BLOCK	
CP306	1-233-150-	COMPOSITION CIRCUIT BLOCK	
CP307	1-233-150-	COMPOSITION CIRCUIT BLOCK	
D102	1-806-937-11	DIODE GMA01	
D251	8-719-200-02	DIODE 10E2	
D252	8-719-200-02	DIODE 10E2	
D253	8-719-200-02	DIODE 10E2	
D254	8-719-200-02	DIODE 10E2	
D301	1-806-937-11	DIODE GMA01	
D302	1-806-937-11	DIODE GMA01	
D303	1-806-937-11	DIODE GMA01	
D351	1-806-937-11	DIODE GMA01	
D352	1-806-937-11	DIODE GMA01	
D353	1-806-937-11	DIODE GMA01	
D354	1-806-937-11	DIODE GMA01	
D355	1-806-937-11	DIODE GMA01	
D356	1-806-937-11	DIODE GMA01	
D357	1-806-937-11	DIODE GMA01	
D358	1-806-937-11	DIODE GMA01	
D359	1-806-937-11	(IT)....DIODE GMA01	
D360	1-806-937-11	(IT)....DIODE GMA01	
D361	1-806-937-11	DIODE GMA01	
D363	1-806-937-11	DIODE GMA01	
D364	1-806-937-11	DIODE GMA01	
D365	1-806-937-11	DIODE GMA01	
FE101	1-463-963-11	FRONT END (FM 3 GANG)	
FE181	1-235-936-11	ENCAPSULATED COMPONENT	
FE182	1-236-178-11	RF BLOCK, LW	
FL301	1-519-453-11	INDICATOR TUBE, FLUORESCENT	
IC101	8-759-805-50	IC CXA1269S	
IC201	8-759-820-10	IC LC7217	
IC251	8-759-820-09	IC LA5667	
IC301	8-759-230-49	IC TMP47C441AN-1662	
L101	1-410-564-41	INDUCTOR	
L102	1-410-564-41	(WG, IT)....INDUCTOR 100UH	
L103	1-408-920-00	INDUCTOR	
L181	1-410-568-21	INDUCTOR	
L301	1-410-564-21	INDUCTOR	
L302	1-410-564-21	INDUCTOR	
L303	1-410-564-21	INDUCTOR	
L304	1-410-564-21	INDUCTOR	
Q101	8-729-266-93	TRANSISTOR 2SC2669	
Q102	8-729-266-93	TRANSISTOR 2SC2669	
Q103	8-729-266-93	(WG, IT)....TRANSISTOR 2SC2669	
Q104	8-729-266-93	(WG, IT)....TRANSISTOR 2SC2669	
Q105	8-729-178-55	TRANSISTOR 2SC2785-E	
Q106	8-729-178-55	TRANSISTOR 2SC2785-E	
Q107	8-729-178-55	TRANSISTOR 2SC2785-E	
Q108	9-986-159-01	TRANSISTOR 2SA1348	
Q109	8-729-806-28	TRANSISTOR 2SC3402	
Q110	8-729-806-28	TRANSISTOR 2SC3402	
Q181	8-729-806-28	TRANSISTOR 2SC3402	
Q182	8-729-820-10	TRANSISTOR 2SA1317-SU	
Q183	8-729-178-55	TRANSISTOR 2SC2785-E	
Q184	8-729-806-28	TRANSISTOR 2SC3402	
Q185	8-729-806-28	TRANSISTOR 2SC3402	
Q186	8-729-806-28	TRANSISTOR 2SC3402	

Ref.No	Part No.	Description	Remark
Q201	8-729-820-12	TRANSISTOR 2SK772-E	
Q202	8-729-820-13	TRANSISTOR 2SC3820	
Q203	8-729-820-12	TRANSISTOR 2SK772-E	
Q204	8-729-820-13	TRANSISTOR 2SC3820	
Q251	8-729-820-10	TRANSISTOR 2SA1317	
Q301	8-729-806-34	TRANSISTOR 2SC3400	

RESISTOR

Ref.No	Part No.	Description				Remark
R101	⚠1-247-704-11	CARBON	220	5%	1/4W	F
R103	1-249-406-11	CARBON	120	5%	1/4W	
R105	1-249-432-11	CARBON	18K	5%	1/4W	
R106	1-249-411-11	CARBON	330	5%	1/4W	
R107	1-249-414-11	CARBON	560	5%	1/4W	
R108	1-249-411-11	CARBON	330	5%	1/4W	
R109	1-249-434-11	CARBON	27K	5%	1/4W	
R110	1-249-432-11	(WG,IT)....CARBON	18K	5%	1/4W	
R111	1-249-411-11	(WG,IT)....CARBON	330	5%	1/4W	
R112	1-249-416-11	(WG,IT)....CARBON	820	5%	1/4W	
R113	1-249-411-11	(WG,IT)....CARBON	330	5%	1/4W	
R114	1-249-434-11	(WG,IT)....CARBON	27K	5%	1/4W	
R115	⚠1-247-700-11	CARBON	100	5%	1/4W	F
R116	1-249-432-11	CARBON	18K	5%	1/4W	
R117	1-249-424-11	CARBON	3.9K	5%	1/4W	
R119	1-215-438-00	CARBON	5.1K	5%	1/4W	
R120	1-215-438-00	CARBON	5.1K	5%	1/4W	
R121	1-215-438-00	CARBON	5.1K	5%	1/4W	
R122	1-249-417-11	CARBON	1K	5%	1/4W	
R123	1-249-437-11	CARBON	47K	5%	1/4W	
R124	1-249-417-11	CARBON	1K	5%	1/4W	
R125	1-249-426-11	CARBON	5.6K	5%	1/4W	
R130	1-249-417-11	CARBON	1K	5%	1/4W	
R131	1-249-417-11	CARBON	1K	5%	1/4W	
R132	1-249-429-11	CARBON	10K	5%	1/4W	
R133	1-249-429-11	CARBON	10K	5%	1/4W	
R149	1-249-747-	CARBON	1.5M	5%	1/4W	
R181	1-249-441-11	CARBON	100K	5%	1/4W	
R182	1-249-437-11	CARBON	47K	5%	1/4W	
R185	1-249-433-11	CARBON	22K	5%	1/4W	
R186	1-249-437-11	CARBON	47K	5%	1/4W	
R187	1-215-493-00	CARBON	1M	5%	1/4W	
R189	1-249-433-11	CARBON	22K	5%	1/4W	
R190	1-249-432-11	CARBON	18K	5%	1/4W	
R191	1-249-433-11	CARBON	22K	5%	1/4W	
R193	1-249-431-11	CARBON	15K	5%	1/4W	
R194	1-249-401-11	CARBON	47	5%	1/4W	
R201	1-249-417-11	CARBON	1K	5%	1/4W	
R202	1-249-417-11	CARBON	1K	5%	1/4W	
R203	1-249-417-11	CARBON	1K	5%	1/4W	
R204	1-249-417-11	CARBON	1K	5%	1/4W	
R205	1-249-425-11	CARBON	4.7K	5%	1/4W	
R207	⚠1-247-696-11	CARBON	47	5%	1/4W	F
R208	⚠1-247-700-11	CARBON	100	5%	1/4W	F
R209	1-249-425-11	CARBON	4.7K	5%	1/4W	
R210	1-249-410-11	CARBON	270	5%	1/4W	
R211	1-249-418-11	CARBON	1.2K	5%	1/4W	
R212	1-249-414-11	CARBON	560	5%	1/4W	
R213	1-249-433-11	CARBON	22K	5%	1/4W	
R214	1-249-421-11	CARBON	2.2K	5%	1/4W	
R215	1-249-425-11	CARBON	4.7K	5%	1/4W	
R216	1-249-405-11	CARBON	100	5%	1/4W	
R217	1-249-423-11	CARBON	3.3K	5%	1/4W	
R218	1-249-410-11	CARBON	270	5%	1/4W	
R219	1-249-418-11	CARBON	1.2K	5%	1/4W	
R220	1-249-414-11	CARBON	560	5%	1/4W	
R221	1-249-425-11	CARBON	4.7K	5%	1/4W	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remark
R222	1-249-421-11	CARBON 2.2K 5% 1/4W	
R223	1-249-425-11	CARBON 4.7K 5% 1/4W	
R224	1-249-405-11	CARBON 100 5% 1/4W	
R225	1-249-429-11	CARBON 10K 5% 1/4W	
R226	1-249-429-11	CARBON 10K 5% 1/4W	
R227	1-249-429-11	CARBON 10K 5% 1/4W	
R228	1-249-429-11	CARBON 10K 5% 1/4W	
R229	1-249-425-11	CARBON 4.7K 5% 1/4W	
R251	1-249-429-11	CARBON 10K 5% 1/4W	
R252	1-249-405-11	CARBON 100 5% 1/4W	
R253	1-249-429-11	CARBON 10K 5% 1/4W	
R254	1-249-413-11	CARBON 470 5% 1/4W	
R256	1-249-429-11	CARBON 10K 5% 1/4W	
R257	1-249-441-11	CARBON 100K 5% 1/4W	
R258	1-249-393-11	CARBON 10 5% 1/4W	
R301	1-249-429-11	CARBON 10K 5% 1/4W	
R302	1-249-441-11	CARBON 100K 5% 1/4W	
R303	1-249-425-11	CARBON 4.7K 5% 1/4W	
R304	1-249-429-11	CARBON 10K 5% 1/4W	
R305	1-249-429-11	CARBON 10K 5% 1/4W	
R306	1-249-441-11	CARBON 100K 5% 1/4W	
R307	1-249-405-11	CARBON 100 5% 1/4W	
R308	1-249-429-11	CARBON 10K 5% 1/4W	
R309	1-249-417-11	CARBON 1K 5% 1/4W	
R310	1-249-429-11	CARBON 10K 5% 1/4W	
RV101	1-228-993-00	RES, ADJ, CARBON 4.7K	
RV102	1-228-995-00	RES, ADJ, CARBON 22K	
RV103	1-228-995-00	RES, ADJ, CARBON 22K	
S301	1-554-303-21	SWITCH, KEY BOARD (1)	
S302	1-554-303-21	SWITCH, KEY BOARD (2)	
S303	1-554-303-21	SWITCH, KEY BOARD (3)	
S304	1-554-303-21	SWITCH, KEY BOARD (4)	
S305	1-554-303-21	SWITCH, KEY BOARD (5)	
S306	1-554-303-21	SWITCH, KEY BOARD (6)	
S307	1-554-303-21	SWITCH, KEY BOARD (7)	
S308	1-554-303-21	SWITCH, KEY BOARD (8)	
S309	1-554-303-21	SWITCH, KEY BOARD (9)	
S310	1-554-303-21	SWITCH, KEY BOARD (10)	
S311	1-554-303-21	SWITCH, KEY BOARD (11)	
S312	1-554-303-21	SWITCH, KEY BOARD (12)	
S313	1-554-303-21	SWITCH, KEY BOARD (+)	
S314	1-554-303-21	SWITCH, KEY BOARD (−)	
S315	1-554-303-21	SWITCH, KEY BOARD (MEMO)	
S316	1-554-303-21	SWITCH, KEY BOARD (MS)	
S317	1-554-303-21	SWITCH, KEY BOARD (AUTO/MANU, MODE)	
S318	1-554-303-21	SWITCH, KEY BOARD (BAND)	
T251	1-404-788-11	TRANSFORMER, DISCRIMINATOR(FM)	
T252	1-404-713-11	TRANSFORMER, IF	
TM101	*1-537-138-21	TERMINAL BOARD (ANT)	
TP101	*1-560-060-00	PIN, CONNECTOR 2P	
XT201	1-567-767-11	VIBRATOR, CRYSTAL	

ACCESSORIES AND PACKING MATERIALS

Part No.	Description
3-312-970-00	SHEET PROTECTION

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